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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,855	06/19/2001	Takeshi Sakuma	782_168	1887

25191 7590 05/22/2003

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EXAMINER

VO, TUYET THI

ART UNIT PAPER NUMBER

2821

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/884,855

Applicant(s)

SAKUMA ET AL.

Examiner

Tuyet Vo

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,8,9 and 12-14 is/are rejected.
- 7) ☒ Claim(s) 4-7,10 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the parallel circuit of a capacitor and resistor connected in series with said free wheel diode must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1-3, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakuma et al. (US Pat. 6,268,754), hereinafter Sakuma.

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Regarding claims 1-3, Sakuma discloses a high voltage pulse generating circuit (Fig. 4) comprising:

a DC voltage source (11) having first and second output terminals;

a first switch (13) having one end connected to the first output terminal of the DC voltage source;

a branch circuit including a free-wheel diode (17) connected across the other end of the first switch and the second output terminal of the DC voltage source; and

a series circuit including an inductance (14) and a second semiconductor switch (16) and being connected in parallel with the branch circuit; wherein after making the first and second switches on to store inductive energy in the inductance, the energy stored in the inductance is commutated to a power semiconductor switch (12) functioned as a load connected across the second switch by turning-off the first and second switches (cols.5-8). The switching elements (13,16) can be formed by semiconductor switching elements (col. 3, lines 39-46)

Regarding claims 8 and 9, Sakuma further discloses as following:

The second switch is turned on again for a short time period after after turning-off the second switch to discharge the energy to the load (col. 4, lines 31-42 and Fig. 5).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma.

Sakuma discloses substantially the claim invention as noted above except for a parallel circuit of a capacitor and/or resistor is connected in parallel/series with the free-wheel diode.

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It would have been an obvious matter of design choice to implement the free-wheel diode with capacitor and/or resistor in order to avoid stress on the diode due to its conduction of a short large current. Such implementation is considered as a routine skill in the art.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma as applied to claim 1 above, and further in view of the admitted prior art cited by the applicant.

Sakuma discloses substantially the claim invention as noted above except for the load is a discharge gap provided in a plasma generating reactor.

The prior art discloses a high voltage pulse generating circuit (Figs. 1 and 2) for arcing the discharge gap (5) in a plasma generating reactor.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the discharge gap as taught by the admitted prior art into the Sakuma high voltage driving circuit in order to excite a plasma gas with a abrupt high voltage to produce a laser pulse at a desired energy.

Allowable Subject Matter

7. Claims 4-7, 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to comprise one of iron cores corresponding for each of second semiconductor elements, wherein all primary windings of corresponding cores connected in series with the free-wheel diode and all secondary winding of corresponding cores connected to gates and cathode terminals respectively constructed in a manner as required in claim 4. The prior art also lacks to teach the first switch and second switch are turned-off simultaneously or the second switch is turned-off immediately after the first switch is turned-off as required in claims 10 and 11.

Citation of pertinent prior art

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9. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Fahlen et al. (US Pat. 4,549,091) discloses electrical excitation circuit for gas lasers.

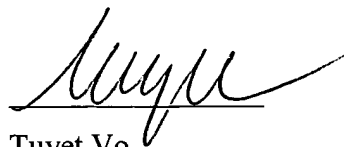
Laudenslager et al. (US Pat. 4,275,317) discloses pulse switching for high energy lasers.

Conclusions

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyet Vo whose telephone number is 703 306 5497. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 703 308 4856. The fax phone numbers for the organization where this application or proceeding is assigned are 703 308 7722 for regular communications and 703 308 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.



Tuyet Vo

May 16, 2003